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Atomic Energy in International Politics

BY HAROLD C. UREY

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Atomic Energy in International Politics

BY HAROLD C. UREY.* Professor Urey worked on the atomic bomb from 1940 on, specializing in isotopes of uranium and the production of heavy water. He was director of the SAM Laboratories at Columbia University until February 1945, and a member of the S-1 Executive Committee of O.S.R.D. At present Dr. Urey is Distinguished Service Professor of Chemistry and a member of the Institute for Nuclear Studies at the University of Chicago.

On August 5, 1945 the United States Army Air Forces dropped an atomic bomb on Hiroshima. The next day, President Truman declared that the bomb was the most revolutionary weapon ever known to man and that steps should be taken to protect mankind from its further use.[1] Ten days later Mr. Churchill declared that the atomic bomb had such great destructive power that, although he approved of America's monopoly of this weapon, mankind would not survive unless human relations were remolded within a relatively short time to prevent the use of the bomb.[2]

In November 1945 Prime Ministers Attlee of Britain and Mackenzie King of Canada visited the United States to discuss with President Truman methods of controlling the use of the atomic bomb. The joint statement signed by the three statesmen following their conference in Washington stressed the unprecedented destructiveness of the bomb, the absence of any defense against it, and the necessity of establishing international arrangements or institutions to prevent its use in the future. In December 1945 Secretary of State Byrnes and British Foreign Secretary Bevin met in Moscow with Foreign Minister Molotov. As a result of their discussions, a communiqué was issued recommending to the United Nations that an Atomic Energy Commission be created to consider schemes for the control of the use of the atomic bomb. At the London meeting of the United Nations in January, on the basis of a resolution introduced by the Big Five and Canada, the Political and Security Committee proposed the creation of the Atomic Energy Commission, with the recommendation that the exchange of basic scientific information for peaceful industry should be extended between all nations; that atomic energy should be controlled to the extent necessary to insure its use for peaceful purposes only; that atomic weapons and all other major weapons adapted to mass destruction should be eliminated from national armaments; and that complying states should be protected against the hazards of violation and evasion by effective safeguards through inspection and other methods. The Commission is to make recommendations as well as an inquiry, and is to report to the Security Council. On January 24, 1946 the General Assembly unanimously accepted the report of the Political and Security Committee, and the Atomic Energy Commission composed of representatives of twelve nations convened at Hunter College on June 14, with Bernard M. Baruch as the American representative.

EFFECTS OF U.S. MONOPOLY

Meanwhile, however, the United States continues to have a monopoly of atomic bombs, the ap-

*I am very much indebted to Professor Edward A. Shils, Assistant Director of the Office of Inquiry into the Social Aspects of Atomic Energy, for continuous assistance in the preparation of this REPORT.

1. "It has never been the habit of the scientists of this country or the policy of this Government to withhold from the world scientific knowledge. Normally, therefore, everything about the work with atomic energy would be made public.

"But under present circumstances it is not intended to divulge the terminal processes of production or all the military applications, pending further examination of possible methods of protecting us and the rest of the world from the danger of sudden destruction." *New York Times,* August 7, 1945.

2. "The bomb brought peace, but men alone can keep that peace, and henceforth they will keep it under penalties which threaten the survival, not only of civilization but of humanity itself. I may say that I am in entire agreement with the President that the secrets of the atomic bomb shall so far as possible not be imparted at the present time to any other country in the world. This is in no design or wish for arbitrary power but for the common safety of the world. Nothing can stop the progress of research and experiment in every country, but although research will no doubt proceed in many places, the construction of the immense plants necessary to transform theory into action cannot be improvised in any country. . . . "So far as we know, there are at least three and perhaps four years before the concrete progress made in the United States can be overtaken. In these three years we must remold the relationships of all men, wherever they dwell, in all the nations. We must remold them in such a way that these men do not wish or dare to fall upon each other for the sake of vulgar and outdated ambitions or for passionate differences in ideology, and that international bodies of supreme authority may give peace on earth and decree justice among men. . . . There is not an hour to be wasted; there is not a day to be lost." *New York Times,* August 17, 1945.

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paratus and plants required for their production, and a very considerable monopoly (to some extent shared with Canada and Britain) of technical knowledge. The possession of this knowledge is of the greatest actual and potential significance in international relations. How has the world reacted to this American monopoly?

The most striking reaction has been a serious deterioration of relations between the Soviet Union, Britain, and the United States since the detonation of the first atomic bomb. This deterioration cannot be entirely attributed to the American monopoly of atomic energy. Part of it is certainly due to the termination of the war, and the consequent end of the urgent necessity for maintaining solidarity among the Big Three. The death of Mr. Roosevelt and the removal from office of Mr. Churchill have also contributed to the difficulties of maintaining the wartime degree of inter-Allied unity. It was inevitable, moreover, that the problems of spheres of influence in the Balkans, the Middle East and the Far East should enhance international tension. It is extremely difficult to assess the significance of the American monopoly of the atomic bomb in world politics, taken apart from these other factors. Americans can well imagine, however, that had the monopoly been possessed by Britain or the Soviet Union, our own feelings of sympathy and trust toward our great Allies would have decreased to a marked extent.

ATTITUDE OF THE U.S.S.R. TOWARD THE BOMB

The ruling group of the Soviet Union undoubtedly remember with resentment the period of their exclusion from international councils during the inter-war years. This boycott of the Soviet Union rose to a high point when it was excluded from the Munich arrangement in 1938. The Soviet press has paid very little attention to the new weapon, presumably because it does not wish to discuss a subject so dangerous to Russia under the present circumstances. It seems probable that Soviet pride has also been injured by the fact that America succeeded in producing the atomic bomb first, as well as by the statements frequently repeated here that no other country can produce the atomic bomb in the near future, and that the United States could remain indefinitely in the lead.[3] These statements have probably been interpreted by the Soviet Union as a slight on the technical capacity of a nation which has come to regard itself as inferior to none in organizing and scientific ability.

Responsible authorities within the Soviet Union do not perhaps take with complete seriousness the occasional proposals which emanate from certain American circles that the atomic bomb should be used immediately against the U.S.S.R., for they undoubtedly realize the regulations set down by our Constitution for the declaration of war; and they must also know a great deal about the general temper of the people of the United States with respect to aggressive warfare. However, the rulers of the Soviet Union remember with bitterness the Allied intervention in the Russian civil war at the end of World War I. Moscow's policy of constructing a ring of buffer or satellite states since V-E Day may mean that the reality of the atomic bomb has not yet become fully clear to Russia's political and military leaders. The Soviet Union fears aggression from the outside; and the development of this new overpowering weapon, the monopoly of which is so frankly publicized by the United States, seems to be interpreted by Soviet leaders as indicating, not that the atomic bomb will be used immediately against it, but that ultimately it may be so used after war has broken out between the Soviet Union and its former Allies. And according to available information the Soviet government has set Russian scientists, as well as German experts in atomic energy, to work on problems of manufacturing the atomic bomb.

BRITAIN'S ATTITUDE TOWARD THE ATOMIC BOMB

Since the detonation of the atomic bomb over Hiroshima, American relations with Britain have also deteriorated. It can hardly be said that this is due to the American policy of monopolizing the atomic bomb, for the British people probably feel certain that we will never use that weapon against them. They may not feel quite so sure, however, that the atomic bomb will not be used in ways injurious to their interests. When the first bomb fell, British public opinion immediately reacted without enthusiasm and with the utmost gravity.

The prevailing view in Britain was that the United Nations Charter had been rendered obsolete, and that an international government with greater power for the maintenance of peace than that possessed by the UN would be necessary.[4] A poll conducted by the British Institute of Public Opinion on August 26 revealed that more than half of the British adult population agreed with the statement: "now that the atomic bomb has been invented . . . each country should abolish its armed forces, having them replaced by an interna-

3. U.S. Senate, 79th Congress, 1st Session, *Atomic Energy—Hearings before the Special Committee on Atomic Energy*, Part 1, pp. 61-62.

4. See E. A. Shils, "British Public Opinion and the Atomic Bomb Menace," *Bulletin of the Atomic Scientists*, January 10, 1946, pp. 5-6.

tional force under a World Government."[5] Mr. Eden and Foreign Secretary Bevin, on November 22 and 23, 1945, made significant statements on the increased necessity for international government, indicating the seriousness with which the British people and their leaders viewed the atomic bomb.[6]

So far as the development of atomic energy is concerned, it is to be expected that, due to Britain's persistent coal crisis, the British will be far more interested than the Americans in the use of atomic energy for power purposes. The prospective exhaustion of coal seams in Britain, the cost of modernizing mining technology, and the difficulties of obtaining an adequate labor supply make it highly desirable for the British to obtain a new source of energy. The British are accordingly anxious to secure the help of the United States in their efforts to develop atomic energy for peacetime purposes, and if such help is not forthcoming, tension between the two countries may be anticipated. This is all the more likely because the British feel that, while they have made essential contributions to the development of atomic energy for military purposes, the United States government which controls the plants and has exclusive possession of a large part of the intimate knowledge of the technical details of this process is reluctant to supply knowledge and materials the British need for peacetime uses of atomic energy.[7]

THE UNITED STATES AND THE ATOMIC BOMB

The United States, as the sole owner of atomic bombs, of atomic bomb plants, and to a large extent of the technical knowledge of manufacturing the new weapon, has naturally taken an attitude different from that of other nations. The first reaction here to use of the bomb was one of great enthusiasm over the imminent end of the war and the resulting opportunity to cut down Allied—especially American—casualties. Unlike Britain, where the demand for international control followed almost immediately, the United States lagged behind until groups of scientists who had worked on the bomb organized themselves to bring before the country facts with regard to the destructiveness of the atomic bomb, the impossibility of adequate defense, the impracticality of keeping secret for any length of time the present knowledge concerning the bomb, and hence the necessity for international control. For a period, there was here a feeling of complacent security because of the belief that the atomic bomb could remain an American monopoly for an indefinite length of time. The belief prevailed that the so-called "secret" could be kept—a belief based on a popular lack of understanding of the nature of the atomic bomb secrets which the United States still had in its possession. Proponents of secrecy argued against proponents of disclosure, in a way which prevented public attention from being focused on the more important issues.[8] The scientists maintained that there was no secret that could be kept indefinitely. A vocal but ill-informed minority of the population therefore jumped to the conclusion that all knowledge should immediately be made public and, in fact, interpreted the scientific statements as leading to this conclusion. Some individuals maintained that other countries could never produce the atomic bomb. The argument over this nonessential point continued in the public press and in the popular mind for a long period of time.

In the meantime, the White House and the State Department moved cautiously in the direction of international control. From the time of his first statement on the atomic bomb, President Truman has declared that the United States looks forward to the establishment of international control, but in most of his statements he has not placed the establishment of international control in the immediate future. On the contrary, he has

5. 51 per cent agreed, 29 per cent disagreed, 20 per cent did not have any definite opinion. These data are supplied by the courtesy of Dr. Henry Durant, Director of the British Institute of Public Opinion.

6. Mr. Bevin said: "I agree that the coming of the atomic bomb and other devastating instruments has caused offensive action to jump ahead both of defense and of the machinery of diplomacy, and the instruments capable of settling world affairs. A remedy with which I heartily agree . . . [is] the surrender of sovereignty . . . there must be established a rule of law, but law must derive its power and observance from a definite source. . . . The supreme act of Government is the horrible duty of deciding matters which affect the life or death of the people. That power rests in this House as far as this country is concerned. *I would merge that power into the greater power of a directly elected world assembly in order that the great repositories of destruction and science, on the one hand, may be their property, against the misuse of which it is their duty to protect us and, on the other hand, that they may determine in the ordinary sense whether a country is acting as an aggressor or not.*

"I am willing to sit with anybody, of any party, of any nation, to try to devise a *franchise or a constitution*—just as other great countries have done—*for a world assembly* . . . with a limited objective—*the objective of peace.*" (Author's italics.) *Parliamentary Debates,* House of Commons, November 23, 1945.

7. See speech of Mr. Raymond Blackburn, M.P. for Birmingham, King's Norton, *Parliamentary Debates,* House of Commons, March 28, 1946, col. 692. For a summary of recent Parliamentary discussion, see E. A. Shils, "Atomic Energy in the House of Commons," *Bulletin of the Atomic Scientists,* May 1946.

8. In November 1945, 85 per cent of the American people thought that the United States should try to keep the secret as long as possible. Nearly three-quarters of the population favored retention of the secret as against the alternative of putting the knowledge under the control of the Security Council. National Opinion Research Center, *Opinion News,* November 27, 1945, p. 2.

inferred that for the time being the bomb will be held as the "sacred trust" of the United States.[9]

The State Department, too, has moved very circumspectly. Until the Moscow Declaration, no official expression of views was offered by the State Department. Thereafter, it again lapsed into silence, broken only by Secretary Byrnes' statement to the press on the eve of his departure to the United Nations Assembly in London,[10] and by his settlement of the dispute within the American delegation in London before the appointment of the Atomic Energy Commission.[11] After this period of silence and hesitation, the State Department on March 28 published under its auspices, but without taking direct responsibility for it, the so-called Acheson Report[12]—the most elaborate, thoughtful and farsighted proposal that has been brought to public attention by any group, private or public, since the atomic bomb burst over Hiroshima. The Acheson Report was explicitly presented "not as a final plan, but as a place to begin, a foundation on which to build." It formed the basis, however, of the proposals presented by Bernard M. Baruch to the United Nations Atomic Energy Commission on June 14.

9. "In our possession of this weapon, as in our possession of other new weapons, there is no threat to any nation. The world, which has seen the United States in two great recent wars, knows that full well. The possession in our hands of this new power of destruction we regard as a sacred trust. Because of our love of peace, the thoughtful people of the world know that that trust will not be violated, that it will be faithfully executed." President Truman, in his Navy Day speech, October 27, 1945. *New York Times,* October 28, 1945.

10. For text of Secretary Byrnes' statement on international atomic energy controls, see Department of State, *Bulletin,* January 20, 1946.

11. Secretary Byrnes said that no secrets would be given away without Congressional approval. "There is no misunderstanding between representatives of the four governments that sponsor the [Moscow atomic bomb] resolution," the Secretary's written statement said. "They understand that the provision as to safeguards is intended to apply to all phases of any plan recommended by the commission.

"Under the language of the resolution it is obvious that the safeguards shall apply to all phases of any plan recommended by the commission.

"Of course, any plan recommended by the commission must be submitted to the governments for ratification by them in accordance with their constitutional requirements."

As soon as Mr. Byrnes made this statement to the press, Senator Arthur H. Vandenberg, who has been critical of what he believed was a tendency on the part of the Secretary to leave the vague language of the resolution unexplained, issued a statement saying that he was "completely reassured."

"I have talked with the Secretary," his statement said. "I am completely reassured upon the two points which I have deemed of paramount importance: (1) that an adequate security arrangement will always precede atomic disclosures and (2) that any plans recommended by the Atomic Commission must receive Congressional approval in the United States.

"My interest has been to make a record that avoids any possibility of international misunderstanding at home or abroad." *New York Times,* January 10, 1946.

12. For complete text of the *Report on the International Control of Atomic Energy,* prepared for the Secretary of State's Committee on Atomic Energy, see Department of State, Publication 2498 (Washington, Government Printing Office, 1946).

EXISTING SITUATION CANNOT CONTINUE UNCHANGED

The existing situation with respect to the atomic bomb must of necessity change in a comparatively short time. The proposals that must be made to avoid destruction by the atomic bomb involve important changes in the organization of human society, and these changes must be brought about in a few years if World War III is to be avoided and if atomic bombs are not to be used in another conflict.

When the first atomic bombs were dropped on Hiroshima and Nagasaki, there was a tendency among some publicists, military men and political leaders to say that it was just another bomb, more terrible and powerful than others, but that it did not alter the situation in a qualitative way. Many doubted that it would have a very devastating effect on modern European and American cities. Recent statements emanating from men who have made special studies of the potentiality for destruction of atomic bombs have substantiated the earlier claims of scientists that the bomb can destroy any structures built by men. The only factor which was unknown, but could in many cases be estimated, was the optimum distance of the exploding bomb from the target to be destroyed. It is now clear that a relatively small number of atomic bombs would effectively destroy any of the large cities of the United States.

There is no adequate defense against atomic bombs made in large numbers and delivered by the great variety of methods which are now available. No method of interception could be expected to have the high degree of efficiency which would be required for adequate defense. This conclusion is justified on the basis of careful consideration of precisely how weapons might be launched and how they might be intercepted, and also on the basis of our general experience with respect to weapons developed in the past, and the methods of defense against them. Complete defense against any modern weapon of war does not exist, and the atomic bomb is a weapon of such overwhelming destructiveness that if even a fraction of the bombs launched against a given target arrive, that target will be completely incapacitated. The attack by such weapons is a saturation attack, and no further resistance is then possible. Scientists have repeatedly stated that no adequate defense against the atomic bomb is to be expected in the future, and this point of view has not been successfully contradicted from any quarter.[13]

13. For the best discussion of the strategic significance of the atomic bombs, see Bernard Brodie, "The Atomic Bomb and American Security," *Yale Review,* January 1946.

THE "SECRET" OF THE ATOMIC BOMB

The "secret" of the atomic bomb is another unstable element in the present situation. The fundamental scientific knowledge from which the atomic bomb was developed is widely known abroad; in fact it originated to a large extent in France, Britain, Italy and Germany, as well as in the United States. It is a long way, however, from such fundamental scientific knowledge to a practical weapon of war, and in the course of the development of that weapon a vast amount of detailed scientific and technical knowledge was accumulated. The secrets mentioned in connection with the bomb consist of certain information of an advanced scientific character with regard to engineering details of plants, many mechanical devices or gadgets, and, finally, the complex technical skill which is required for the successful operation of plants and industrial processes. All of this information is in the hands of the United States at the present time, and parts of it have been available to Canadian and British scientists as well. Other countries possess the fundamental scientific information, and through the release of the Smyth Report[14] they have a great deal of additional information about the specific methods which proved so successful in the production of the materials used in the atomic bomb. All these "secrets" can be rediscovered by the scientists and engineers of other countries. Because of the great industrial capacity of the United States, it is probable that we could repeat the work which led to the production of the atomic bomb here more quickly than this could be done by any other country, but it is impossible to keep our methods secret for an indefinite period of time.

The plants required for the production of the atomic bomb and the materials for the bomb, as well as the construction of the bomb itself, required a fairly large fraction of the industrial resources of the United States, which is rich in skilled workmen in the most diverse fields. Those who claim that America could remain indefinitely in the lead if there were to be an atomic armaments race sometimes rest their arguments on the denial that other states would have at their disposal sufficiently large numbers of such skilled workers. It is highly probable, however, that other industrialized countries would be able to provide workers similarly skilled. The production of military weapons of other types also calls for many skilled workers, engineers and scientists, and the atomic bomb appears to require the same order of magnitude of technical competence as is required for the production of good tanks, modern battleships, or first-class military airplanes.

In order to maintain the monopoly of the atomic bomb, the United States, or the United States, Britain and Canada, must have a monopoly of the raw materials from which the bomb is made, namely, the uranium and thorium mines of the earth. Uranium is a widely distributed element in all igneous rocks, but its occurrence in fairly highly concentrated form is rather rare. Such well-known sources as the Belgian Congo, Czechoslovakia, and the Great Bear region of Northern Canada can hardly be expected to represent all the important deposits that are likely to be found. But it cannot be stated whether the Soviet Union has or has not sufficient supplies of uranium within its boundaries to make atomic bombs. It is to be expected that ores of lower concentrations than those used in the past can be worked in the future, particularly because of the great value to be attached to the element uranium.

CAN U.S. REMAIN IN LEAD?

There is one other method of retaining the advantages conferred at present by the possession of the "secret," namely, the maintenance of an effective lead over all competitors. If any leakage of the information now monopolized by the United States could be prevented, could we maintain the lead of this country against all possible competitors? A vigorous program of research and development during the next years on the part of the United States would undoubtedly produce more effective bombs than we have at present, and would certainly produce better means of delivery. Very considerable improvement in these weapons is to be expected on the basis of our past experience with military weapons. The field of atomic energy is new indeed, and remarkable improvements are highly probable. If the United States were to make a determined effort to concentrate its resources on the production of atomic bombs, it would have in five or ten years a large stockpile of extremely destructive bombs, whereas other countries would have stockpiles of a far less damaging type, like those used in World War II. It should be pointed out here that after sufficient bombs of any variety have been secured to destroy the civilian and industrial centers of another country, further increases in the size of stockpiles of bombs or in the size of bombs become of minor importance. Hence the proposal to keep ahead of all competitors does not seem to be a feasible solution of the atomic bomb problem.

It must be our conclusion that the present

14. H. D. Smyth, *Atomic Energy for Military Purposes* (Princeton, Princeton University Press, 1945).

American monopoly will not last indefinitely. The consequences of an attempt to maintain this monopoly will not be unchallenged American supremacy in this field and willing acceptance of our assumption of worthiness to guard the sacred trust. Rather, the consequences will be an armaments race in the production of atomic bombs, and a feverish development of new modes of destruction, perhaps even more effective than atomic bombs. The end of that race can only be an atomic bomb war.

EFFECTS OF ATOMIC ARMAMENTS RACE

International relations in a world where the great powers and perhaps some of their satellites are in possession of atomic bombs will be qualitatively very different from a world in which the great powers maintained large armies and navies. The movements of large armies and navies could not be concealed from the intelligence services of the countries against which they were moving. Not even the *blitzkrieg* technique of World War II could escape Allied intelligence, nor could the *blitzkrieg* completely overcome the enemy. Although the presence of large armies across a nation's frontiers before World War II disturbed the international equilibrium, it never presented the threat of immediate total destruction against which there could be no defense.

In a situation, however, in which atomic bomb stockpiles exist, terrible disturbances in the conduct of international relations are to be expected. Under such circumstances every diplomatic crisis, no matter how minor, will make government officials as well as all average citizens of each country wonder whether an unannounced attack by atomic bombs will not start at any moment. Minor conflicts of interests between states which can ordinarily be negotiated and resolved without difficulty, minor personal frictions between diplomats in various countries which are ordinarily not of major significance, will under these circumstances be magnified by all participants into major diplomatic crises, and actually they will be major diplomatic crises, because each official will be in a continuous state of fear lest his next step result in the outbreak of an atomic war.

It is true, of course, that the almost universal possession of atomic bomb stockpiles by the major powers would deter potential aggressive nations from use of the bomb because instantaneous retaliation could be expected, provided that all diplomats and all major government officials were completely rational. Who would wish to plunge his country into an atomic bomb war, only for the satisfaction of destroying the enemy in spite of one's own complete destruction? No one. But the answer to this question assumes complete rationality on the part of all concerned. Such rationality is not to be expected in every case on the part of government officials, even in the normal periods, but fear and anxiety have especially the effect of decreasing rational behavior on the part of persons placed in dangerous positions. Accordingly, instead of creating universal abstention from the use of atomic bombs because of fear of retaliation, the fear itself would destroy the probability that rational behavior would occur.

VULNERABILITY OF UNITED STATES

In an atomic bomb armaments race, the United States, despite the possibility of greater ingenuity on the part of our scientists, a larger output of atomic bombs, and greater destructiveness of each bomb, would be at a disadvantage as compared with the Soviet Union, which must be assumed to be the most probable enemy of the United States in the event of another major war. First, the United States is more vulnerable to atomic bomb attacks. For one thing, it is more highly urbanized than the Soviet Union. Although the Soviet Union has undergone considerable urbanization in the last 25 years, it can expect further urbanization of its population, while new trends in the production of power would make it possible for the Soviet government to avoid the same degree of concentration of its population that had occurred in already industrialized nations like Britain, the United States and Germany. Industry in the United States is highly concentrated in certain areas of the country and further shifts, although bound to occur, can only be gradual unless a drastic dispersion policy is instituted by the government. The Soviet Union, on the other hand, covering a much larger land area than this country, is still in the process of building up its industries, and the prospective industrial developments in Siberia, which were furthered by the war, will result in a wider dispersion of Soviet industrial plants than occurs in the United States. Moreover, the rate of industrialization and urbanization in the Soviet Union in the coming two decades is likely to be more rapid than that of the United States, already at a high level from which the rate of ascent will be less steep.

Inasmuch as Soviet society is a planned society, where great power is concentrated in the hands of the ruling group, and the mass of the population is relatively submissive to commands from above, it will be possible for future urbanization and industrialization in the Soviet Union to be planned on the basis of a dispersion pattern which

will minimize the amount of destruction from atomic bombs. The execution of a dispersion plan in the United States would be far more difficult because it would involve breaking up otherwise relatively stable settlements and forcing already existing industrial enterprises to shift their location —problems which Soviet planners would not face.

Even if all the obstacles to dispersion such as the opposition of the American people to comprehensive governmental control, the resistance of real estate owners to the destruction of urban real estate values, and so forth, were overcome, dispersion of the urban population would not entirely redress the balance in America's favor, because of the relative sizes of the land masses to be defended.

The participation of the United States in the atomic armaments race, carried on a large scale and coupled with a certain measure of dispersion, would necessarily result in giving a large measure of power in peacetime to the military—that is, much larger than the military has ever before exercised in this country during periods of peace.

Our discussion points to the conclusion that it will be very difficult to live in a world of states armed with atomic bombs and other mass weapons. In view of this conclusion, it should be pointed out that those who are recommending the construction of a peaceful world on the basis of the United Nations, with many nation-states armed with large supplies of the most destructive weapons history has ever known, and at the same time contributing part of this armament to the UN as a world force, disregard the fundamental conditions needed for peace. The existing world arrangement concerning weapons of war can result in nothing less than the most violent war of all history. It is impossible to maintain peace, and hence control atomic weapons, by any system in which all the political subdivisions of the world are armed to a maximum with these weapons. Nor is it proper or expedient that all nations of the world should be completely disarmed while the world authority is armed with large numbers of instruments of mass destruction, including the atomic bomb. The peoples of the world will not wish to live under an international government that threatens them with atomic bombs, and their present leaders would be most reluctant to relinquish their power to such a Leviathan. Atomic bombs should exist nowhere in the world. They should not be in the possession of any government of any kind.

PROSPECTS FOR WORLD GOVERNMENT

A world government must be established, or civilized man will perish. Modern means of production, transportation, communication, and the modern methods for waging war make such a government both possible and necessary. The question is, when and how? Will world government emerge in a few years, or in centuries? Will it come about as a result of further world wars, or without them? World War II was fought by the Germans with the objective of establishing their domination over a large area of the earth. The next war could, in its destructive course, be justified to its participants only in the name of the unification of the world under the authority of the conqueror. However, it is conceivable that an atomic bomb war would so disrupt communication and transportation that even a completely victorious power might be unable to coordinate and control the whole earth. There will thus be world government, either peacefully and voluntarily attained, or attained by a degree of violence which will destroy much of the material culture of Western man and also a large proportion of Western men.

Yet it is not likely that in the very immediate future there will be an adequate world government capable of controlling the atomic bomb. It is therefore necessary to consider temporary expedients, which may prevent the outbreak of war and contribute to the gradual and peaceful movement of the peoples and governments of the world toward the voluntary acceptance of some components of international government.

THE ACHESON REPORT

As has been pointed out earlier in this REPORT, the principal governments of the world have agreed that atomic energy and other weapons of mass destruction should be controlled by the United Nations; and the UN has established an Atomic Energy Commission, composed of representatives of twelve nations: the eleven members of the Security Council (Australia, Brazil, China, Egypt, France, Mexico, the Netherlands, Poland, the United Kingdom, the United States and the U.S.S.R.), plus Canada.

Meanwhile, as already noted, a committee working at the behest of the Department of State of the United States has published certain proposals for the international control of atomic energy which are presented as bases for further discussion of the problem. The committee which prepared this report consisted of Mr. David Lilienthal, Chairman, of the Tennessee Valley Authority; Dr. J. Robert Oppenheimer, Professor of Physics at the University of California; Mr. Harry A. Winne, Vice President of the General Electric Company; Mr. Charles A. Thomas, Vice President of the Monsanto Chemical Company; and

Mr. Chester I. Bernard, President of the New Jersey Bell Telephone Company. This committee reported to a committee of the State Department, consisting of Mr. Dean Acheson, Mr. J. J. McCloy, President J. B. Conant, Dr. Vannevar Bush and Major General Leslie R. Groves. The conclusions reached by the committee are very similar to views expressed by the great number of scientists who have worked on the problem of the atomic bomb, individually and through representatives of their organized federations.

The Acheson Report recognizes from the outset the basic propositions about the atomic bomb which many scientists entering the political arena for the first time in their lives had been proclaiming since August 1945. These basic propositions are that atomic bombs can be made in large numbers; the secrets of their manufacture cannot be kept indefinitely; there is no adequate military defense; and the use of such weapons in modern war would be destructive beyond anything ever seen up to the present time. Accepting these premises, the committee set itself the problem of offering a reasonable program to the United Nations Commission. In doing so, it has attempted to draw up a proposal which the United States, in the favorable position it occupies at the present time, could be expected to accept, and at the same time has tried to find a scheme which would be acceptable to the representatives of other states.

ATTEMPT TO PREVENT ARMAMENTS RACE

The members of the Acheson Committee do not seek to solve the ultimate problem of war, nor do they provide a method for preventing the use of atomic bombs in the case of a future war. Their proposals are directed toward the prevention of an armaments race and its negative consequences for international relations. They have sought to establish a pattern of international control which might reasonably be expected to control the manufacture of atomic bombs, and hence lead by a gradual process to an adequate world government which would be able to prevent war, and thus bring about ultimate solution of the atomic bomb problem. If no control of the atomic bomb is accomplished in the immediate future, the United States will lose its monopoly in the course of a number of years, and it is to be expected that other countries of the world will also make atomic bombs and store them. We will therefore arrive at a situation where no country has a particular advantage over any other, and all have atomic bombs. The Acheson Report recommends a plan by which the United States gradually releases its present information, and thus loses its monopoly over a period of years; but at the end of that time no country and no government would be in the position of having an atomic bomb stockpile. The Report provides positive tasks for an Atomic Energy Commission to do, which would bring positive benefits to the people of the world. The control program therefore envisages not a merely negative police organization, which would irritate and frustrate people, but one which in coupling negative with positive functions would attract scientists and technicians of outstanding caliber who might not otherwise be willing to serve an agency that would not permit them to carry on creative or at least positive activities.

CONTROL OF RAW MATERIALS

The key point of the Acheson Report is the proposal that all uranium and thorium deposits in the world shall be ceded to the Atomic Energy Commission by the present nation-states, and that all mining of these elements shall be in the hands of the United Nations Atomic Energy Commission alone. The Atomic Energy Commission should be permitted by the terms of the agreement to conduct geological surveys of the entire surface of the earth, wherever the best geological opinion believes that uranium or thorium might be found. Deposits discovered as a result of these surveys should be ceded to the Atomic Energy Commission. The Commission should also be empowered to conduct aerial surveys over those parts of nation-states in which the geological characteristics are such that uranium or thorium might be found. The surveys themselves must be carried on periodically, and frequently enough so that clandestine prospecting and mining of uranium and thorium can be detected and prevented. Plants for the processing of the ores and the production of fissionable materials must be owned and operated by the Atomic Energy Commission. Present plants for production of fissionable material, such as those in the United States, must come ultimately under the ownership and operation of the Atomic Energy Commission in the course of the establishment of the control scheme proposed by the Report. Fissionable materials and by-products in small quantities for research and therapeutic purposes should be distributed to all legitimate medical, scientific, educational and industrial organizations in all countries on application, and on condition that inspection of their uses shall be carried out by engineers and scientists attached to the enterprises using them and on the rolls of the Atomic Energy Commission. Until the control scheme is fully in operation, it may be advisable to prohibit the use of fissionable materials in

large quantity for the production of power. (This point is not included in the Acheson Report.) It is of course possible that this restriction may be unnecessary, because the control scheme might be established within a period during which the economic use of fissionable materials for power is not yet sufficiently developed. Since, however, most of the nations will probably wish to begin to develop installations for the production of atomic power, and since, from the political point of view, it is advisable to combine "positive aspects" of atomic energy with the control aspects of the program, the omission of this restriction may be desirable.

There has been some discussion of the feasibility of the use of denatured materials; that is, materials which cannot be used for the manufacture of atomic bombs except after considerable purification, but at the same time are useful for power purposes. Questions such as this are not essential. As time goes on, we will undoubtedly find many modifications of technical details, and as these situations arise, they must be met in the way which seems most feasible at the time. All research and experimentation on military aspects of atomic energy are to be prohibited to the nation-states signatory to the agreement and concentrated entirely in the hands of the Atomic Energy Commission. The AEC will maintain laboratories in which investigations will be carried on in nuclear physics and in the technical problems of power production as well as in military uses. The AEC laboratories should of course employ the best personnel available in the world and there should be continuous interchange of personnel between laboratories operated by the various states or private organizations within states and AEC laboratories.

These techniques and arrangements will avoid the necessity of a large staff of inspectors roaming over the earth "snooping" into factories of all sorts and determining whether clandestine bomb production is going on. Such an arrangement will also avoid the difficulty of recruiting qualified scientific and engineering personnel willing to leave their professional work in sufficient numbers to devote themselves to tasks which would be entirely negative in content, however important they may be politically. Under the proposed scheme the positive and productive services of scientists and engineers would not be lost to mankind, because they could continue their work in the laboratories and atomic energy plants of the AEC or the national plants later to be established.

NEW CONCEPT OF SOVEREIGNTY

Although the inspection scheme envisaged by the Acheson Committee does not propose the establishment of a world government, it goes far beyond present concepts of national sovereignty. If the scheme is to obtain the acceptance of the members of the United Nations organization, certain political preconditions will have to exist. Each major state which otherwise could have developed atomic energy by its own efforts will have to be assured that, in the long run, atomic energy will be available to it for economic development without restrictions other than the requirement that the inspection and control system be maintained. The danger of the seizure or diversion of unsafe materials will remain a continuous danger which can be overcome only if the inspection system is trustworthy and the various member states are convinced of that trustworthiness. Otherwise, there will be perpetual fear lest one of the member states divert unsafe materials and use them for illicit purposes, and this fear will lead normally law-abiding citizens to carry on clandestine activities of their own. Thus mutual confidence and confidence in the adequacy of the control system will be necessary both for the acceptance and the successful operation of the system. On the political side, diplomats, publicists, educators, and other leaders of government and public opinion must exert their greatest efforts and skill in alleviating the already serious rifts in solidarity among the three great powers, and particularly between the Soviet Union and the United States. Adroitness in day-to-day diplomatic relations carried on under trying circumstances will be the first responsibility of the Soviet Foreign Ministry and the United States Department of State. The primary task of the State Department and the British Foreign Office will be the creation of conditions under which the Soviet Union will feel that it is not being made party to a scheme whereby the United States would retain a long enduring monopoly of the bomb stockpile and the secrets of bomb construction, and is assured that the United States and Britain have no aggressive designs on it. This task will necessarily involve operations far outside the sphere of atomic energy.

The faults of the proposals contained in the Acheson Report lie more outside that Report than within it, and particularly in the structure of the United Nations. This Report proposes an Atomic Development Authority which would exercise the powers outlined in the Report, and in using these powers, would become more powerful and influential than the United Nations itself. This pro-

posal for an ADA, which is the keystone of the control program submitted by the United States to the United Nations Atomic Energy Commission on June 14, calls to mind the Tennessee Valley Authority, of which Mr. Lilienthal is Director. But the TVA has a far less difficult task to administer than that posed by the control of atomic energy and, moreover, it reports to a stable and well-established federal government, with a stable history and stable traditions. The proposed Atomic Development Authority would report to the United Nations, which is not a government, and which as yet commands very little loyalty from the peoples of the world. Because of this situation, it is well for people not to assume that the Acheson Report constitutes a complete solution of the problem and, while supporting its proposals, to recognize that it is vitally necessary to strengthen the United Nations organization so as to convert it from a loose league of states into a real world government. The United Nations has the power, under the terms of its Charter, to convert itself into a world government by amendments of that basic document.

It is important that the world government of the future have well-defined executive, judicial and legislative functions and the right to finance itself through taxation. A fundamental principle of government is that its laws shall apply to individuals and not to political subdivisions alone, and a statement of the fundamental rights of citizens is necessary if we are not to fear such a government. But it is not necessary that world government have a bicameral legislature, a president and particular and specific voting arrangements, or that the franchise be based on manhood suffrage. What is necessary at this juncture is not an outline of the structure of government, but a firm resolve on the part of our people that we shall approach the peoples of other countries with a proposal to organize such a world government. The details can be worked out only as a result of discussions, attempts to convince, willingness to understand, and compromise at the appropriate time.

ACTION FOR THE FUTURE

The first step in the solution of the atomic bomb problem should be the education of the people of the United States to the facts with regard to this problem, through presentation of the view that the only defense against the atomic bomb and other major weapons of war which will permit continuation of Western civilization, or of any other stable civilization, is control of these weapons of war by an adequate international government. Until this educational process has been accomplished, it is not possible for the government of the United States to develop an effective foreign policy looking to the control of the atomic bomb.

Simultaneously with this attempt to educate the people of the United States, it is necessary to carry out vigorous attempts to secure the adherence of other countries of the world to such a program. With this objective in view, the President of the United States, the State Department, and Congress should do everything that lies within their respective fields of endeavor to bring the problem of the international control of the atomic bomb and other weapons of war before other countries of the world, with the attempt to secure their adherence to an adequate method of control. Time is short, and a program of control should be pushed with the greatest vigor, and never for a moment should the activity be allowed to lag. This has not been true in the past, and it is time that the dilatory handling of the atomic bomb problem be brought to an end.

In carrying out this program, every effort should be made to convince other countries of the world that it is not our intention to meddle in their internal affairs and that we wish no outside meddling in our affairs, except in so far as is absolutely necessary for the adequate control of weapons of war.

We must always be prepared for the possibility of failure of our most sincere and well-intentioned efforts. If it should not prove feasible to secure the adherence of all countries of the world, we should at least secure the adherence of as many countries as possible. This would mean a partial world government, which should continuously hold out to non-adhering governments and peoples the opportunity to join at any time. Such a development might split the world into two or more contending groups. That would be unfortunate, but at the present time, without any control or any union among 51 nations of the world except the weak link of the United Nations, the grim fact is that there is no adequate control over the atomic bomb. An attack by an aggressor nation armed with atomic bombs would reduce the world to complete ruin. If a start is made toward world government by even a considerable number of nations joining together, there is a possibility that this nuclear government would grow to embrace other countries of the globe, and that World War III could thus be avoided. If we fail, as Mr. Baruch said on June 14, "we have dammed every man to be the slave of fear."

Proposals for Control of Atomic Energy—*presented on behalf of the United States by Bernard M. Baruch at the opening session of the United Nations Atomic Energy Commission on June 14, 1946.**

1. GENERAL—The authority should set up a thorough plan for control of the field of atomic energy, through various forms of ownership, dominion, licenses, operation, inspection, research and management by competent personnel. After this is provided for, there should be as little interference as may be with the economic plans and the present private, corporate and state relationships in the several countries involved.

2. RAW MATERIALS—The authority should have as one of its earliest purposes to obtain and maintain complete and accurate information on world supplies of uranium and thorium and to bring them under its dominion. The precise pattern of control for various types of deposits of such materials will have to depend upon the geological, mining, refining and economic facts involved in different situations.

The authority should conduct continuous surveys so that it will have the most complete knowledge of the world geology of uranium and thorium. Only after all current information on world sources of uranium and thorium is known to us all can equitable plans be made for their production, refining and distribution.

3. PRIMARY PRODUCTION PLANTS — The authority should exercise complete managerial control of the production of fissionable materials. This means that it should control and operate all plants producing fissionable materials in dangerous quantities and must own and control the product of these plants.

4. ATOMIC EXPLOSIVES — The authority should be given sole and exclusive right to conduct research in the field of atomic explosives. Research activities in the field of atomic explosives are essential in order that the authority may keep in the forefront of knowledge in the field of atomic energy and fulfill the objective of preventing illicit manufacture of bombs. Only by maintaining its position as the best informed agency will the authority be able to determine the line between intrinsically dangerous and non-dangerous activities.

5. STRATEGIC DISTRIBUTION OF ACTIVITIES AND MATERIALS—The activities entrusted exclusively to the authority because they are intrinsically dangerous to security should be distributed throughout the world. Similarly, stockpiles of raw materials and fissionable materials should not be centralized.

6. NON-DANGEROUS ACTIVITIES—A function of the authority should be promotion of the peace-time benefits of atomic energy. Atomic research (except in explosives), the use of research reactors, the production of radioactive tracers by means of non-dangerous reactors, the use of such tracers, and to some extent the production of power should be open to nations and their citizens under reasonable licensing arrangements from the authority. Denatured materials, whose use we know also requires suitable safeguards, should be furnished for such purposes by the authority under lease or other arrangement. Denaturing seems to have been over-estimated by the public as a safety measure.

7. DEFINITION OF DANGEROUS AND NON-DANGEROUS ACTIVITIES—Although a reasonable dividing line can be drawn between dangerous and non-dangerous activities, it is not hard and fast. Provision should, therefore, be made to assure constant re-examination of the questions, and to permit revision of the dividing line as changing conditions and new discoveries may require.

8. OPERATIONS OF DANGEROUS ACTIVITIES — Any plant dealing with uranium or thorium after it once reaches the potential of dangerous use must be not only subject to the most rigorous and competent inspection by the authority, but its actual operation shall be under the management, supervision and control of the authority.

9. INSPECTION—By assigning intrinsically dangerous activities exclusively to the authority, the difficulties of inspection are reduced. If the authority is the only agency which may lawfully conduct dangerous activities, then visible operation by others than the authority will constitute an unambiguous danger signal. Inspection will also occur in connection with the licensing functions of the authority.

10. FREEDOM OF ACCESS — Adequate ingress and egress for all qualified representatives of the authority must be assured. Many of the inspection activities of the authority should grow out of, and be incidental to, its other functions. Important measures of inspection will be associated with the tight control of raw materials, for this is a keystone of the plan. The continuing activities of prospecting, survey and research in relation to raw materials will be designed not only to serve the affirmative development functions of the authority, but also to assure that no surreptitious operations are conducted in the raw materials field by nations or their citizens.

11. PERSONNEL — The personnel of the authority should be recruited on a basis of proven competence but also so far as possible on an international basis.

12. PROGRESS BY STAGES—A primary step in the creation of the system of control is the setting forth, in comprehensive terms, of the functions, responsibilities, powers and limitation of the authority. Once a charter for the authority has been adopted, the authority and the system of control for which it will be responsible will require time to become fully organized and effective. The plan of control will, therefore, have to come into effect in successive stages. These should be specifically fixed in the charter or means should be otherwise set forth in the charter for transitions from one stage to another, as contemplated in the resolution of the United Nations Assembly which created this commission.

*Owing to lack of space, only the first 12 out of 15 points are given.

In the July 1 issue of FOREIGN POLICY REPORTS:

CHILE IN TRANSITION *by Olive Holmes*